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**Coordination, programme and other questions: malaria and diarrhoeal diseases, in particular cholera**

## Preventive action and intensification of the struggle against malaria and diarrhoeal diseases, in particular cholera

### Report by the Secretary-General

*Summary*

The present report responds to Economic and Social Council resolution 1995/63, in which the Council, *inter alia*, requested the Secretary-General to submit to the Council, at its substantive session of 1998, the report of the Director-General of the World Health Organization (WHO) on the implementation of the strategies and work plans presented to the Council at its substantive session of 1995. This report has been prepared by WHO in collaboration with other relevant organizations, agencies, organs and programmes of the United Nations system. A list of these entities is contained in the annex to the report.

Malaria and diarrhoeal diseases, including cholera, continue to impede social and economic development in developing countries. Since the endorsement by the General Assembly, in its resolution 49/135, of the Global Malaria Control Strategy of WHO[1] and the endorsement by the Assembly in its resolution 50/128 and by the Economic and Social Council in its resolution 1995/63 of the strategies and work plans for the prevention and control of malaria and diarrhoeal diseases, in particular cholera, developed by WHO and agreed upon with other United Nations organizations, foundations for reducing the impact of malaria have been firmly established and malaria morbidity and mortality have been reduced in several countries. Yet increased and sustained funding is required.

* E/1998/100.

[1] WHO, *A Global Strategy for Malaria Control* (Geneva, 1993).

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Special efforts have been made to support countries in responding to epidemics of diarrhoeal diseases, including cholera. Over the past three to four years, national plans have been developed or updated and there has been a reduction in the case-fatality rate. For control in the longer term, improvements in environmental sanitation and food safety and implementation of health education programmes are required.

Greater political and financial commitment is needed to implement and accelerate efforts to prevent and control malaria and diarrhoeal diseases. These efforts represent important means for helping to combat poverty, a major underlying factor in the extent and severity of these diseases.

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# I. Malaria

## A. Current situation

1. Malaria is by far the world's most important tropical parasitic disease. There are 300 million-500 million cases of, and 1.5 million-2.7 million deaths from, malaria every year. Worst affected are the poorest countries and those living under the most difficult circumstances. Malaria undermines the health and welfare of families, and is a drain on the resources of both countries and individuals, limiting their ability to contribute to economic and social development.

2. Most malaria cases and deaths (90 per cent) occur in sub-Saharan Africa, mainly in young children. Malaria epidemics are common in Africa, and have occurred recently among refugees from the conflict in the Great Lakes area, and in Southern African countries. In other areas of the world, serious problems remain in frontier areas of economic development and in countries affected by social disruption. The situation is made worse by severe problems of parasite resistance to drugs in the South-East Asian peninsula. Two thirds of the cases of malaria in the Americas occur in the Amazon basin as a result of colonization and mining in forest areas.

3. Of particular concern is the recent resurgence of malaria in the temperate zone in areas where the disease was previously under control (Azerbaijan, Iraq, Tajikistan and Turkey). These epidemics followed a rapid deterioration in malaria prevention and control due to military conflicts followed by economic crisis.

4. However, appropriate implementation of malaria control is having an impact on malaria morbidity and mortality in countries including Brazil, China, some Indian States, Oman, the Philippines, Solomon Islands, Thailand, Vanuatu and Viet Nam, as well as enabling others to maintain their malaria-free status.

## B. Global Malaria Control Strategy and Action Plan for Malaria Control (1995-2000)

5. The objectives of the Global Malaria Control Strategy of the World Health Organization (WHO)[1] are to prevent mortality and reduce morbidity and its social and economic consequences through the progressive improvement and strengthening of national and local capabilities to control malaria. It has four basic elements:

- To provide early diagnosis and prompt treatment;
- To plan and implement selective and sustainable preventive measures, including vector control;
- To detect early, contain or prevent epidemics;
- To strengthen local capacities in basic and applied research so as to permit and promote the regular assessment of a country's malaria situation, in particular the ecological, social and economic determinants of the disease.

Within this framework, WHO developed an Action Plan for Malaria Control (1995-2000)[2] its two main objectives being:

- That by the year 1997, at least 90 per cent of countries affected by malaria would have implemented appropriate malaria control programmes;
- That by the year 2000, malaria mortality, as compared with that for 1995, would have been reduced by at least 20 per cent in at least 75 per cent of affected countries.

## C. Implementation

6. Priority continues to be given to malaria-endemic countries in sub-Saharan Africa where over 90 per cent of the world's malaria cases occur. During 1997-1998, the Director-General of WHO allocated US$ 20 million over two years for intensified support to 24 priority countries in Africa. By mid-1997, 47 of the 49 malaria-endemic countries in Africa had completed national plans of action for malaria control. Worldwide, over 90 per cent of countries affected by malaria are at various stages of implementing appropriate malaria control programmes thus meeting the target set in 1995.

7. Malaria control is increasingly being integrated with general health services and other disease and public-health programmes. Examples are collaboration with the WHO/United Nations Children's Fund (UNICEF) Initiative for the Management of Childhood Illnesses, the Maternal and Child Health Programme in Tajikistan, the Public Health and Rehabilitation Programme for Eritrea (PHARPE) and the South-East Anatolian Development (GAP) irrigation scheme in Turkey.

### Development of national capacities for malaria control

8. WHO has developed a training programme based on the concept of intercountry national training of trainers. By the end of 1997, over 16,000 trainees had been trained at

district and community levels. Regional training centres have been established in Wad Medani (Sudan) and Bandar-e 'Abbās (Islamic Republic of Iran), and an Asian Collaborative Training Network was formed in 1996 by programme managers from Bangladesh, Cambodia, China (Yunnan province), Indonesia, the Lao People's Democratic Republic, Thailand and Viet Nam.

9. Standard protocols for the assessment of the therapeutic efficacy of antimalarial drugs have been developed to facilitate the development and monitoring of antimalarial drug policies. Intercountry training courses on the monitoring of therapeutic efficacy were carried out in Burkina Faso, Cameroon, the Gambia and Sri Lanka (1997) and in Brazil (1998). The protocols are being used to monitor drug policies in 23 sub-Saharan African countries, all malaria-endemic countries in the WHO South-East Asia Region, and selected countries in the Americas Region and the Western Pacific Region.

10. During 1996-1997, intercountry training courses on the management of severe malaria were conducted in Burkina Faso, Cameroon, Madagascar, Malawi, Myanmar (with the support of the Japanese International Cooperation Agency (JICA) and the Sudan). Projects to strengthen community-based malaria control with an emphasis on disease management are under way in Ethiopia and Eritrea, supported by Italian Development Cooperation, and were completed in 1996 in Ghana, Uganda and Zambia with support from the Department for International Development (DFID) of the United Kingdom of Great Britain and Northern Ireland. These activities are now being expanded as part of the initiative for accelerated implementation of malaria control in Africa.

11. In many malaria-endemic countries, counterfeit and poor-quality antimalarial drugs impose severe limitations on disease management. A centre for the quality control of drugs has been established in Malaysia. There is now a need to establish similar centres on a regional basis.

12. In 1996, the United Nations Development Programme (UNDP)/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) completed trials of insecticide-treated mosquito nets (ITMNs) in areas of stable malaria in Africa. They showed reductions in all-cause mortality of 15-33 per cent in children under age 5. The challenge now is to translate these research results into sustainable implementation programmes.

13. In the framework of the Regional Network for Pesticides for Asia and the Pacific (RENPAP), the United Nations Industrial Development Organization (UNIDO)/UNDP established a technical cooperation unit bio-pesticides (*Bacillus thuringiensis* and *Bacil sphericus*) in the Hubai Academy of Sciences in China promote technology transfer in bio-pesticides for mala control in the Asia-Pacific region.

14. During 1996-1997, intercountry training worksh on selective vector control were carried out in Brazil (w World Bank support) and Ethiopia, India, Indones Pakistan and Turkey (with UNDP support).

15. The guidelines *Malaria Control among Refugees a Displaced Populations* and *Malaria Epidemics* have be published and widely distributed to provide support national programmes, international agencies and n governmental organizations. In 1996-1997, intercoun workshops on epidemic detection, prevention and cont were held in Ethiopia, Namibia and the Sudan. Natio courses for district medical officers and health workers epidemic-prone areas of India and Nepal were carried with support from the DFID of the United Kingdom. Pl of action for epidemic control were developed a implemented in northern Iraq (with the assistance of former Department of Humanitarian Affairs of the Uni Nations Secretariat, UNICEF and the European Communit

16. National plans for malaria control have been develop to counter the resurgence of malaria in the new independent States of Central Asia and the Caucasus, a are being implemented in Armenia, Azerbaijan, Kazakhst Kyrgyzstan, Tajikistan and Uzbekistan. These activities ha been carried out with support from the WHO Collaborati Centres at the Istituto Superiore di Sanità (Rome), and t Martsinovsky Institute of Medical Parasitology and Tropi Medicine (Moscow), Italian Development Cooperation a JICA.

### Research and development

17. Disease management is being compromised by t problem of drug resistance and the limited number antimalarials available. TDR is therefore giving priority the development of pyronaridine, to provide a potentia safe alternative for chloroquine; to chlorproguanil/dapso as an alternative to sulfadoxine/pyrimethamine; and formulations of artemisinin derivatives for the treatment severe malaria in remote areas.

18. In view of the reduced interest of the private sector developing tools for malaria control, a new initiative w launched by TDR in 1996 to develop a partnership with t private sector to mobilize both financial and hum resources. A formal proposal has been developed, wit major focus on antimalarial drug discovery a

development, and is now being considered by key private and public organizations.

19. Dipstick diagnostic tests for *Plasmodium falciparum* have been developed by the private sector. Guidelines on their use have been developed by WHO. Combined tests for *Plasmodium falciparum* and *Plasmodium vivax* are being developed but cost remains a constraint on their widespread use.

20. During pregnancy, women are at high risk of malaria. However, chemoprophylaxis is difficult to implement owing to poor compliance and the limited number of suitable drugs. Studies in Malawi supported by the United States Centers for Disease Control and Prevention (CDC) and TDR-supported studies in Kenya suggest that intermittent treatment with sulfadoxine pyrimethamine during antenatal care may be a possible alternative.

### Vaccines

21. Cost-effective vaccines remain one of the main targets of malaria research. Several potential vaccine antigens have been identified but, owing to the complexity and cost of vaccine development and the relative lack of commercial interest, only a few candidate vaccines have entered clinical trials. The one most extensively studied clinically is SPF-66, against Plasmodium falciparum, which was developed in Colombia and donated to WHO. Results to date demonstrate that the vaccine is safe and provides partial protection against malaria in areas of high and low transmission. However, studies in children aged 6-11 months in the Gambia and in children aged 2-15 years in Thailand have not confirmed the induction of a protective effect. This vaccine is under further development. RTS,S, a very promising candidate against Plasmodium falciparum, entered clinical trials in the Gambia in 1998. Additional resources, however, are needed to accelerate developmental work on these and several other potential candidate vaccines.

22. Active collaboration is occurring between the WHO Pesticide Evaluation Scheme (WHOPES) and industry. During 1997, evaluations of 16 insecticide products and three pesticide applications have taken place in 16 countries involving 20 institutions.

### Operational research

23. Operational research capabilities in most national malaria control programmes are inadequate and funds are limited. Small grant initiatives were established by WHO in 1995 for strengthening research capability for development of national antimalarial drug policies, use of ITMNs and selective vector control. In the Americas, priority is being given to identifying the most cost-effective interventions for malaria control in the framework of health sector reform and decentralization. Funds should be sought for capacity-building in the universities of malaria-endemic countries.

## D. Recent global developments

### Coordination with United Nations organizations

24. In March 1996, malaria was identified as a priority component of the inter-agency United Nations System-wide Special Initiative on Africa. The fact that this is resulting in increased activities on and increased visibility for malaria is also reflected currently in the Organization of African Unity (OAU) activity described below.

25. An Inter-agency Meeting for the Coordination of Action against Malaria in November 1997 identified resources to develop options for more effective coordination of the growing number of public and private initiatives to strengthen malaria prevention and control. It was attended by several organizations of the United Nations family, OAU, bilateral development agencies and malaria-endemic countries.

26. A communications network for information exchange between agencies and malaria programme managers is being established through cooperation between the World Bank and WHO.

27. UNICEF developed a plan of action on malaria control, with emphasis on the use of ITMNs, at an informal consultation in June 1997 attended by WHO and other partners. Meanwhile, a proposal is being finalized for joint WHO and UNICEF intensified collaboration on malaria control in several African countries.

28. In 1997, WHO and the United Nations Educational, Scientific and Cultural Organization (UNESCO) signed a memorandum of understanding to collaborate on education and protection of child health through the development of education materials, training of teachers and other education personnel, and use of the mass media. Country-specific projects to induce changes in malaria prevention practices and health-seeking behaviour in communities are planned in Ethiopia, Zimbabwe and Tajikistan to evaluate the effectiveness of school-based interventions.

29. The Panel of Experts on Environmental Management for Vector Control (PEEM) continues to provide a formal inter-agency framework for collaboration by WHO, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP) and the

United Nations Centre for Human Settlements (Habitat) in the prevention and control of malaria and other vector-borne diseases within the context of land and water resource development. PEEM has intensified efforts to promote a health component in the programmes of the Consultative Group on International Agricultural Research (CGIAR); and developed the course "Health Opportunities in Water Resources Development", which was organized in Central America (1996) and India (1997). Training materials from this five-year project will be produced and marketed in 1998. In 1996-1997, PEEM provided cost-effectiveness training for managers of vector control programmes in the Americas and South-East Asia, and participated in investigations of the association between rice production systems and malaria schistosomiasis in West Africa.

30. WHO, the World Meteorological Organization (WMO), and UNEP carried out a joint assessment of possible health impacts of global climate change, including malaria and diarrhoeal diseases.

#### Organization of African Unity

31. In June 1997, the Assembly of Heads of State and Government of OAU adopted at its thirty-third ordinary session, held in Harare, Zimbabwe, the Harare Declaration on Malaria Prevention and Control in the Context of African Economic Recovery and Development (A/52/465, annex II, declaration AHG Decl.1 (xxxiii)). In the Declaration the Assembly pledged to consider malaria control a priority, reaffirmed its endorsement of the Global Malaria Control Strategy and the actions of WHO in its implementation, and called upon member States to give political support to malaria control, to develop and implement plans of action for malaria prevention and control, and to ensure well-coordinated multisectoral action.

#### Multilateral Initiative on Malaria in Africa (MIM)

32. A Multilateral Initiative on Malaria in Africa (MIM) has been established to strengthen research in malarious countries. This followed meetings in Senegal and the Netherlands in 1997, involving WHO, the World Bank, other United Nations organizations, the European Commission, the National Institutes of Health (United States of America), the Wellcome Trust, research workers from Africa and developed countries, and international donor agencies. Within the initiative, the TDR Task Force on Malaria Research Capability Strengthening in Africa is promoting the strengthening of institutions engaged in malaria research and this represents a multi-partner collaborative funding strategy.

## E. Financing malaria control: new investments

33. Financial support for malaria control to date has been largely insufficient, particularly in sub-Saharan Africa. The most significant new investment in the region has been the initiative of the Director-General of WHO to allocate a total of US$ 20 million to priority countries for 1997 and 1998. In addition, the United States Agency for International Development (USAID) has provided US$ 2 million for the period 1994-1997 and the United Kingdom's DFID has invested US$ 1.8 million for malaria control in Africa for the period 1997-2000. The World Bank is considering long-term commitment to malaria control for the Region.

34. In WHO's Western Pacific Region, the lack of financial resources in national budgets is being partly offset by the renewed commitment of partner agencies to support malaria control. For 1995-1998, the World Bank has provided US$ 10 million to Cambodia, US$ 5.4 million to the Lao People's Democratic Republic and US$ 30 million to Viet Nam. AusAID has provided funding to the Lao People's Democratic Republic and Solomon Islands and will provide US$ 5.4 million to Viet Nam. The European Union has provided some US$ 5.4 million to Cambodia, US$ 6.5 million to the Lao People's Democratic Republic, and US$ 15 million to Viet Nam for 1996-1999, with an additional US$ 5.4 million for intercountry activities between these countries. Additional support for 1996-1997 was provided to Solomon Islands by bilateral partnerships of AusAID, Rotary International, New Zealand, and the Republic of Korea, and to Papua New Guinea, Solomon Islands and Vanuatu by Japan. UNDP is also providing US$ 500,000 in 1997-1998 for community-based malaria control in Solomon Islands.

35. Major new investments in South-East Asia include a loan of US$ 173 million from the World Bank to India for 1997-2002, US$ 1.5-2.0 million over five years as part of the joint World Bank/DFID world population project in Bangladesh, US$ 5 million from AusAID for the development of epidemiological surveillance of communicable diseases, including malaria, in Indonesia for 1997-1999, and US$ 1.8 million from UNDP to support malaria control as part of primary health care in Myanmar up to 1999.

36. In contrast, external investments for malaria control showed a marked reduction in the Americas from US$ 37 million in 1995 to US$ 8 million in 1996 as a result of reduced support to Brazil. The World Bank, however, is studying the possibility of a loan for malaria control in Bolivia.

#### Constraints and future challenges

37. Implementation of the Global Strategy is constrained by a series of misconceptions including that:

- Malaria control is a "vertical" programme;
- An impact on morbidity and mortality cannot be made with existing tools;
- Malarial control is the responsibility of the health sector alone;
- Malaria in Africa is uniform and can be controlled by a "magic bullet".

This has led to reduced political and financial commitment at local, national and international levels. There is a shortage of people with knowledge of malaria epidemiology and entomology. Peripheral health services are often unequal to the task of diagnosing malaria and correctly treating it, and few countries have operational training programmes based on a needs assessment. This is now beginning to change.

38. Mechanisms to ensure the availability and rational use of affordable and effective drugs are required at all levels of health care, including the private sector. There is a need to improve intersectoral collaboration as well as collaboration between countries facing similar problems in malaria control. Surveillance systems need to be improved to ensure effective programme implementation and to boost information exchange. There is limited national capability for operational research to evaluate and support control activities. Finally, there is limited commitment within the private sector to developing new tools for malaria control and a need to improve the links between research and development and the needs of malaria control.

### F. Conclusions

39. The foundations for reducing the impact of malaria have been firmly established. Several countries have achieved reductions in malaria morbidity and mortality. The message is clear: malaria can be controlled with the tools available. The challenge now is to apply these tools so as to protect the most vulnerable groups and to sustain the gains in the face of problems such as the spread of drug resistance.

40. Countries in sub-Saharan Africa will continue to receive priority, given the high incidence of the disease in the countries of the region. Although some funds to accelerate malaria control in these countries have recently been provided, they are not sufficient. In addition, funding, even at the present level, cannot be assured from 1999 onwards. Member States of the Economic and Social Council can assist by continuing to remind the world of its commitment to malaria control as part of sustainable development.

41. Research and development must be continued and strengthened to provide new and affordable drugs, diagnostic tests and vaccines, and the new approaches required as the malaria situation evolves and changes. The Economic and Social Council can play a major role in encouraging member States and the private sector to make resources available to meet these needs.

42. Many malarious countries are in the process of implementing economic and health reforms. Little information is available to date on the impact of these reforms on malaria and there is a need to consider how to decentralize specialized malaria services and to carefully monitor the process.

43. Information exchange is an essential requirement for improved global, regional, and national cooperation within the United Nations system. The Economic and Social Council, with its continued interest in the intensification of the struggle against malaria, provides an important forum for maintaining the political commitment needed to ensure the implementation of cost-effective programmes.

## II. Diarrhoeal diseases, in particular cholera

### A. Current situation

44. Cholera remains a global threat. Although it is responsible for only a small proportion of the some 2 million childhood deaths caused by diarrhoeal diseases, epidemic cholera differs from other diarrhoeal diseases in that it often affects older children and adults and can kill within hours. In 1996, over 143,000 cases of cholera and almost 7,000 deaths were reported to WHO, each figure representing a tenth of the estimated number of occurrences.

45. The most effective means of supporting health systems in preventing and treating cholera and other categories of epidemic diarrhoea is through implementing routine national programmes for the control of all forms of diarrhoeal

diseases, and complementing them with epidemic preparedness measures. This is the approach supported by WHO and UNICEF which are partners in promoting the Integrated Management of Childhood Illness to address diarrhoea, acute respiratory infections, measles, malaria and malnutrition – conditions accounting for 70 per cent of childhood deaths and three out of every four episodes of childhood illness. This integration is important because most sick children present with signs and symptoms related to more than one condition, and a single diagnosis may neither be possible nor appropriate.

46. Cholera is one of the key indicators in respect of social development. While the disease no longer poses a threat to countries with a minimum of healthy living conditions, it remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be assured. Almost every developing country is now facing either a cholera outbreak or the threat of an epidemic.

47. In 1996, Africa accounted for most reported cholera cases, and there was a 53 per cent increase in the incidence of the disease over the previous year. The case-fatality rate (CFR) was 5.7 per cent, the highest figure in any region. Experience has shown that, with a rapid and effective response to epidemics of diarrhoeal diseases, the CFR can be kept as low as 1 per cent. Political instability, leading to uncontrolled migration of populations both within countries and across borders, and natural disasters such as drought have been factors in the increased incidence.

48. In WHO's Americas Region, the number of cholera cases has decreased since 1992 and the CFR has been kept to under 1 per cent. This is a tribute to efforts to strengthen case management training in national diarrhoeal diseases control programmes, mobilize international and bilateral funds for country intervention and prevention projects, and establish inter-agency collaborative support with countries. Such efforts are particularly encouraging in countries where large outbreaks occurred in 1991 and 1992, since they reflect strong regional commitment to the prevention of enteric diseases and to public education at both individual and community levels. The efforts in this region to improve and strengthen water distribution, sewage treatment systems, health education campaigns, and food safety have been reflected in the continuing decrease in the number of cases and deaths.

49. In Asia, 13 countries reported cholera cases to WHO in 1996, with particularly high CFRs in some of the countries affected. However, it is well known that some countries in the region do not report cholera cases for fear of sanctions from other countries.

50. In 1994, the fact that over 2,500 indigenous cholera cases were reported from six countries in Europe, a 30-fold increase over the previous year, was attributable to the profound economic and social changes that had affected public-health and sanitation systems, especially in Eastern Europe.

## B. Global Epidemic Diarrhoeal Diseases (EDD) Control Strategy and Action Plan

51. The WHO Task Force on Cholera Control was established in April 1991 by the Director-General of WHO in response to the global resurgence of cholera. In 1997, in order to enhance the capacity of the task force and strengthen international efforts to control cholera, WHO extended membership to 20 major agencies. The first meeting of this new partnership was held in Geneva in November 1997. Key recommendations included the establishment of a computerized information system for cholera and a list of regional stocks of cholera-related supplies.

52. WHO emergency stores for Africa are situated in Harare, Zimbabwe, and in terms of logistics, storage and movement of stocks are organized through an agreement with the Government of Zimbabwe medical stores.

53. Since the early 1990s, coincident with the most severe drought of this century, countries in East and Southern Africa have had to contend with recurrent epidemics of severe diarrhoea due both to cholera and to bacillary dysentery. These diseases have taken a heavy toll, killing thousands during the epidemic period and, in the longer term, affecting national economies.

54. Because of recurrent epidemics of severe diarrhoea due both to cholera and to bacillary dysentery in East and Southern Africa, it was decided to establish a subregional project known as the Southern Africa Initiative. This initiative has sought to develop and implement a more coordinated and action-oriented approach to epidemic preparedness and control. In 1997, a joint evaluation team comprising staff from WHO and donors reported that the project was successful and should be replicated in other regions. Similar subregional projects are now being implemented in West Africa (covering 16 countries) and in the Horn of Africa (covering 8 countries).

55. Since the beginning of the cholera epidemic in 1991, the countries of the Americas Region have stepped up surveillance and laboratory control efforts. A wide range of projects were financed by the Organization of the Petroleum

Exporting Countries (OPEC) Fund for International Development, the Governments of Sweden, Italy, the Netherlands and Germany, and the United States Centers for Disease Control and Prevention (CDC). The largest source of funding was the Inter-American Development Bank. Similar activities have been carried out in the Eastern Mediterranean, Western Pacific and South-East Asia Regions of WHO.

### Strengthening national capacities

56. Training activities carried out in African countries include courses on epidemic preparedness and response in Malawi, Zambia and Swaziland; development of guidelines, including dysentery case management and laboratory diagnosis, in Malawi, Swaziland, Zambia and Zimbabwe; and training in participatory methods for environmental hygiene in Malawi and Zambia. In the Americas Region, 124 training courses and seven regional seminars were held, training over 11,000 health workers.

57. The subjects of the operational research carried out during the last two years include:

- Social and environmental factors influencing the transmission of shigella dysentery in rural and urban areas of Zimbabwe;
- Treatment of dysentery in health centres in Mozambique;
- Incidence and modes of transmission of dysentery in Kwazulu-Natal, South Africa;
- Cholera transmission in Zambia;
- Clinical trials of ciprofloxacin for the treatment of shigella dysentery in children (a multicentre study taking place in South Africa and Zimbabwe).

58. A *Bulletin of Epidemic Diarrhoeal Diseases in Southern Africa* is produced by the subregional project team and used to share epidemiological information among countries. In the Americas Region, two cholera surveillance surveys were carried out, in 1993 and 1996. An early warning system for epidemic diarrhoeal diseases is functional in most countries throughout WHO's six Regions.

### Laboratory capacity quality assurance

59. In Southern Africa, at least one laboratory in each country involved in the subregional projects is able to accurately and reliably identify *Vibrio cholerae* and *Shigella* species, and some countries are now participating in external quality control. In the Americas Region, over 100 workshops were held during 1991-1996, training over 3,000 health workers and technicians in laboratory methods and diagnosis.

### Development and dissemination of materials

60. In the course of developing a wide range of published material, priority has been given to those publications relating to epidemic dysentery. The topics range from laboratory issues, case management and preparedness to environmental sanitation and health education. An "Epidemic Diarrhoeal Diseases Preparedness and Response" training course has been developed and field-tested and is now being implemented. In addition, a series of laboratory materials has been developed and distributed through WHO channels.

61. Health education materials have been developed and studies carried out to identify risk factors for dysentery. A key document produced is *Community Participation for the Prevention of Diarrhoeal Diseases* which makes use of participatory methodology.

62. Revision of the Cholera guidelines has been carried out in consultation with the relevant agencies. The new guidelines, to be distributed in 1998, will include consideration of such issues as *Vibrio cholerae* O139, the new oral cholera vaccines, resistance to commonly recommended antibiotics, and dealing with cholera outbreaks occurring among refugees or displaced populations.

63. A new version of the document "Guidelines for the control of epidemics due to *Shigella dysenteriae type 1*" is now available and has been widely distributed. Meanwhile, regular fact sheets have been issued on recent changes in treatment protocols for shigella dysentery, as well as specific recommendations for the management of outbreaks in complex emergency situations, such as the mass movement of populations during the recent crisis in the Great Lakes region.

64. Fact sheets and technical cards on environmental sanitation were produced and widely distributed in collaboration with the Division of Rural Environmental Health, together with district-level training materials in participatory methods for environmental and personal hygiene education related to the control of diarrhoeal diseases.

### Research and development

### Monitoring of *Vibrio cholerae* O139

65. The ongoing seventh cholera pandemic which started in 1961 in Indonesia is caused by *Vibrio cholerae* O1,

biotype El Tor. Until recently, only *Vibrio cholerae* strains of serotype O1 were known to cause cholera epidemics, while non-O1 strains were associated with sporadic cases of cholera. However, in 1992 a severe outbreak of cholera in the Bay of Bengal was traced to a *Vibrio cholerae* non-O1 strain with serotype O139. The fast spread of this new strain to neighbouring countries facing the Bay of Bengal and the quick notification of imported cases of this strain in developed countries raised global concern about a possible new pandemic of cholera.

66. The number of countries officially reporting *Vibrio cholerae* O139 was seven in 1993, five in 1994, and one in 1995. Imported cases were reported from Estonia, Germany, the Republic of Korea and the United States (in 1993) and Japan and Singapore (in 1994). No imported cases were reported in 1995, and none to date in 1996.

67. Although the new strain had already been introduced in many countries by 1992, the threat of a global epidemic does not appear to have been confirmed by the data officially reported to WHO. Since *Vibrio cholerae* O1 and O139 present and spread almost identically, the WHO-recommended strategies to control and prevent cholera remain the same.

68. UNDP, UNIDO and the National Oceanic and Atmospheric Administration (United States) are using the sensitive membrane antigen rapid test (SMART) to monitor *Vibrio cholerae* in the control of wastes of Côte d'Ivoire and Ghana.

### Food safety policy development

69. An important milestone in food safety was the establishment by FAO and WHO of the Codex Alimentarius Commission to implement the joint FAO/WHO Food Standard Programme. WHO conducted food safety studies in Zambia, Viet Nam, and the United Republic of Tanzania, and the findings and recommendations are being used for the development of guidelines and training materials on food safety for health workers and mothers. WHO is developing training materials for health workers in food safety relating to diarrhoeal diseases.

### Vaccines

70. Over the past 17 years, substantial progress has been made in the development of oral cholera vaccines. Two new types of oral cholera vaccines have been developed and proved to be safe, immunogenic and effective.

71. The first is Killed whole cell/B subunit vaccine (WC/rBS), an oral vaccine requiring two doses given one week apart in a buffer solution. Studies carried out in Sweden, Bangladesh and South America have shown it to be safe and highly effective (85 per cent) in the short term against cholera classical (Bangladesh) and El Tor (Peru) biotypes.

72. The second is Live CVD 103-HgR vaccine, a genetically engineered *Vibrio cholerae* O1 strain administered as a single-dose oral vaccine. Studies in a number of countries have proved the safety and efficacy of CVD 103-HgR, against *Vibrio cholerae* of either classical or El Tor biotype and either Inaba or Ogawa serotype, one week after administration of a single oral dose. A large-scale field trial is under way in Indonesia to determine the efficacy of a single dose of this vaccine in areas where cholera is endemic.

73. A WHO meeting in 1995 considered the potential use of new cholera vaccines to prevent or control outbreaks of cholera in acute emergencies. It was concluded that, during the acute phase of an emergency, when crude death rates exceed 1-2/10,000/day, cholera immunization is not recommended, either to prevent possible outbreaks or control ones already under way. A study protocol to evaluate the feasibility and acceptability of WC/rBS in stable refugee camps was prepared and carried out in Uganda during 1997. The results are now being analysed.

74. The use of cholera vaccines as a public-health tool is limited by their price and short duration of protection and by the fact that there is no experience to date on their use on a large scale in areas where the disease is either endemic or epidemic.

## C. Constraints and future challenges

75. Because cholera is a social problem, disease prevention and control activities require a multisectoral approach. Improvements in environmental sanitation and food safety and implementation of health education programmes are essential for long-term prevention.

76. There is an urgent need to establish coordinated plans, in collaboration with external partners, in particular UNICEF and bilateral agencies, to meet the needs of countries in the areas of case management, epidemiological surveillance, outbreak investigation and control, laboratory support, health education and long-term prevention through improvements of water supplies, sanitation and food safety.

77. Efforts are also needed to demystify the word "cholera" and disseminate public information to avoid inappropriate responses to outbreaks, including trade

embargoes, tourism restrictions, quarantine or excessive isolation, and mass chemoprophylaxis.

78. Over the past few decades, natural and man-made disasters have sparked off unprecedented population movements. These have provided conditions for the spread of cholera, which has been documented in more than 12 camps; some, like the outbreak that affected refugees in Goma, Democratic Republic of the Congo (formerly Zaire), in July 1994, have had devastatingly high mortality rates. Better prevention measures are needed. Outbreaks of dysentery caused by a multi-resistant strain of *Shigella dysenteriae* type 1 are also causing similar problems. WHO's cholera task force, in collaboration with the Office of the United Nations High Commissioner for Refugees (UNHCR), UNICEF and major relief organizations, is making efforts to ensure the coordination and promotion of best public-health practices to deal with epidemics in emergency situations.

79. Greater political and financial commitment is needed to ensure implementation of both medium- and long-term cholera prevention measures. Investment in cholera prevention efforts will have a crucial impact on the reduction of the prevalence of other diseases related to poor sanitary and environmental conditions. With the El Niño phenomenon, many countries in Latin America are experiencing increased cholera incidence. Unless effective action is taken, 1998 will be another dramatic cholera year. In the next millennium, cholera will be a problem in major cities unable to meet water and sanitation needs for migrant populations.

### D. Conclusions

80. The current response to cholera tends to be reactive, taking the form of a well-organized emergency response. While this can prevent many deaths, it fails to prevent cholera cases. The Economic and Social Council can emphasize that all partners involved in cholera control should incorporate long-term prevention activities in their cholera emergency response.

81. Special efforts have been made to support countries in the development of policy and action plans for preparedness and response to epidemics of diarrhoeal diseases. All countries involved in the subregional initiatives have developed plans of action for the control of epidemic diarrhoeal diseases, or have updated existing plans. In comparison with the state of preparedness in these countries in 1994, there has been an improvement in response capability over time.

82. The CFR – a reliable indicator of the impact of the cholera preparedness project – decreased for both cholera and dysentery over the three to four years for which data are available (1994-1997).

83. A major effort has been made in the area of preparedness for and response to outbreaks of *Shigella dysenteriae* type 1 (Sd1), since materials and understanding of epidemic dysentery were very limited at the outset of the project.

84. While national preparedness and response capacity has improved in many countries affected by cholera, much remains to be done to improve water supplies, sanitation and food safety. To reduce cholera morbidity, the Economic and Social Council can highlight the need to adopt a multisectoral approach involving the programmes of United Nations organizations related to health education, training, environmental sanitation and poverty alleviation.

85. Since subregional projects have proved to be successful, the Economic and Social Council can also promote their support as a way of addressing the problem of epidemic diarrhoeal diseases in regions affected or threatened by cholera.

86. The private sector should be involved in cholera prevention activities in countries affected or threatened by cholera. The new cholera task force should identify more innovative ways to involve the private sector, including the tourism industry, especially in those countries where the economy is dependent on tourism.

87. Best public-health practices for the management of outbreaks of epidemic diarrhoeal diseases among refugees or displaced populations should be disseminated and applied.

## III. General conclusions

88. Malaria, cholera and other diarrhoeal diseases remain diseases of poverty. Fighting poverty will help prevent them. At the same time, preventing and controlling these diseases, using the tools currently available, are also significant means to help combat poverty.

89. New tools for prevention and control are needed, however. Private industry and the industrialized countries have major contributions to make, especially in the areas of new drugs and vaccines.

90. The members of the United Nations family along with a wide array of other partners are already actively engaged in both research and control efforts to prevent and control these diseases. Markedly increased support from all partners

is needed, however, both to help apply the current tools and to develop better ones. This is the concern of everyone, ranging from the communities where such diseases are endemic to the public, private and voluntary sectors at national and international level. Furthermore, everyone stands to gain from these efforts viewed as contributions to community, national and world development.

91. **Member States of the Economic and Social Council can assist by continuing to remind:**

- **The world of its commitment to the control of these diseases as part of sustainable development;**
- **Countries implementing economic and health reforms of the need to assess the impact of these reforms on efforts to control malaria;**
- **Member States and the private sector of the need to sustain research and development to ensure that new tools for disease control are made available at affordable prices;**
- **Member States, United Nations organizations, major donors, non-governmental organizations and other elements of civil society including the private sector of the need for continued financial support, particularly to those regions where the incidences of the diseases are greatest;**
- **Member States, United Nations organizations, non-governmental organizations and other partners in disease control that exchange of information is essential in ensuring the implementation of cost-effective programmes.**

*Notes*

[1] WHO, *A Global Strategy for Malaria Control* (Geneva, 1993).

[2] WHO, Division of Control of Tropical Diseases, unpublished document (CTD/MAL/95.2).

# Annex

## List of collaborating organizations

Department of Economic and Social Affairs of the United Nations Secretariat

Department of Humanitarian Affairs of the United Nations Secretariat

Food and Agriculture Organization of the United Nations (FAO)

International Labour Organization (ILO)

United Nations Development Programme (UNDP)

United Nations Environment Programme (UNEP)

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Office of the United Nations High Commissioner for Refugees (UNHCR)

United Nations Children's Fund (UNICEF)

United Nations Industrial Development Organization (UNIDO)

World Bank

World Food Programme (WFP)

World Health Organization (WHO)